MEETING MINUTES (FINAL)

CITY OF TUCSON HABITAT CONSERVATION PLANS
Technical Advisory Committee (TAC)
Wednesday, June 18, 2008, 1:00 – 4:00 p.m.
U.S. Fish & Wildlife Service, Tucson Field Office
201 North Bonita Ave, Suite 141
Tucson, AZ 85745

ATTENDEES

City of Tucson (COT) Habitat Conservation Plans (HCPs) Technical Advisory Committee (TAC) members present:
Dennis Abbate (Arizona Game and Fish Department – Research Branch)
Marit Alanen (United States Fish and Wildlife Service)
Rich Glinski (Arizona Game and Fish Department – *retired*)
Trevor Hare (Coalition for Sonoran Desert Protection)
Ries Lindley (City of Tucson – Tucson Water Department)
Linwood Smith (EPG, Inc.)

Other Attendees present:
Steve Anderson (Pima County Natural Resources Parks and Recreation)
Travis Bean (University of Arizona)
Jamie Brown (City of Tucson – Office of Conservation and Sustainable Development)
Mike Cross (Westland Resources)
Locana de Souza (Arizona Game and Fish Department)
David Jacobs (Arizona Attorney General's Office)
Lynn Rae (Westland Resources, Inc.)
Phil Rosen (University of Arizona)
Geoff Soroka (SWCA)

1. Welcome, introduction, and TAC Charter

2. Review of TAC meeting minutes: April 16, 2008

The minutes were approved with an edit from Rich and a correction from Jamie.

3. Updates

<u>U.S. Fish and Wildlife Service (USFWS) species' status review for cactus ferruginous pygmy-owl and Mexican garter snake</u>

Regarding the cactus ferruginous pygmy-owl (CFPO), Marit reported that a "90-day finding" was published on June 2 in the Federal Register explaining that "we [USFWS] find that the petition [to list the cactus ferruginous pygmy-owl (*Glaucidium ridgwayi cactorum*)] presents substantial scientific or commercial information indicating that listing the pygmy-owl may be warranted." The USFWS is currently requesting comments from the public on the status of the CFPO to determine if the species warrants listing. The USFWS has initiated a 12-month status review of the species. Marit said that a portion of the review will be based on genetic work currently underway by Glenn Proudfoot. The USFWS petition included three listing options, which are: 1) The Arizona Distinct Population Segment, 2) The Sonoran Desert Distinct Population Segment, and 3) the western subspecies of the owl (*Glaucidium ridgwayi cactorum).* Questions should be directed to Scott Richardson or the USFWS web site. Dennis said that Glenn Proudfoot's main emphasis is to examine the differences between the Sonoran and Sinaloan populations. The information from this work may support previous work examining eastern and western populations.

With the Mexican garter snake, Marit reported that the species has already undergone a 12-month review and finding process. In the original 12-month finding, the Washington, D.C. office of the USFWS determined that there was not enough information about the species' status in Mexico to warrant listing. However, that decision has been retracted and the USFWS is now re-initiating that process. She thought that the latest 12-month finding would be available in November and will be based on its range-wide status. The petition asked the service to look at three, different scenarios: 1) A distinct-population segment in the United States, 2) It's range-wide status based on its U.S. status and 3) its range-wide status based on its entire range.

Trevor asked about the status of the Tucson shovel-nosed snake. Marit said that the 90-day finding should be published soon. She said to contact her with questions about that species.

Pima Pineapple Cactus information gathering

Jamie reported that, after the last Habitat Conservation Plan (HCP) Technical Advisory Committee (TAC) meeting, he sent the questions, maps, and request letter to biologists and others identified by the TAC to help answer questions. OCSD has asked that those responses be provided by June 24. Two responses have been received thus far.

Response to question regarding HCP covered bat species and bridges

Dennis reported that there is a suite of bat species that utilize bridges or similar structures in urban areas. With regard to the HCP covered bat species – Lesser long-nosed bat (LLNB) and pale Townsend's big-eared bat (PTBB) – the experts Dennis consulted said that they have occasionally witnessed bats under bridges. In the opinion of Dennis and those at the Arizona Game and Fish Department (AGFD) he asked, bridges do not provide essential roosting or reproductive habitat. These bats might be found under bridges every once in a while, the occurrence of which might be connected to the fact that many of these bat species utilize washes as foraging areas and movement corridors. Bridges just happen to be a convenient stopover. Dennis noted that he didn't think that Sandy Wolf had found either LLNB or PTBB during her Master's thesis work surveying bridges in Tucson.

Dennis said that bridges may be important to bat species not covered by the HCP. Since the TAC has the opportunity to influence bridge design, construction methods, and maintenance activities suitable for bats through the HCP process, the TAC should encourage making bridges bat friendly. Dennis said that it should be noted that he and other AGFD staff do not know if night roosts play a significant role for LLNB and PTBB. Tim Snow of AGFD believes that bridges are connected closely with foraging areas and LLNB and PTBB might be selecting foraging areas based on proximity to night roosts for rest. However, there is currently no evidence to support this.

Fire study in Avra Valley

Jamie reported that a buffelgrass fuel loading and fire behavior study occurred on May 27 and took place on 160 acres of City-owned lands in Avra Valley. Ries said that he expects that a report will be written and sent to Tucson Water staff. Travis Bean, who was present during the fire study, said that Chris McDonald spoke at a recent Cooperative Species Management meeting. As part of Chris' presentation, he said that a report for the public will be written along with a scientific paper. Chris and others studied burn characteristics for fighting buffelgrass fires. Over 50 firefighters were present from six or seven districts. The fire burned buffelgrass infested property at the intersection of Reservation and Milewide Road. They burned four strips and another 70 meter by 70 meter plot west of Reservation Road. Flame lengths were recorded at 15 to 25 feet high. Wind speeds were recorded at two miles per hour and surface temperatures reached 1,700 degrees Fahrenheit. Travis said that a normal grass fire would have 6 to 8 foot flame heights and 400 to 800 degree maximum temperatures. The 70-meter by 70-meter plot burned in under three minutes with very little wind. Travis said that fire crews can build fire breaks at a rate of 30 chains (1,980 feet, 0.375 miles) per hour on flat ground. In contrast, this buffelgrass fire spread at 140 chains (9,240 feet, 1.75 miles) per hour with almost no wind. From those preliminary fires, it appears that crews will not be able to fight buffelgrass fires manually. Instead, retardant will have to be dropped on it. Travis said that Chris, Perry Grissom (National Park Service), and Guy McPherson spent a lot of time preparing the plots with temperature sensing equipment and other instrumentation. He added that the fire created its own weather, including fire tornadoes. Travis said the leaf bases of buffelgrass were untouched by the fire. Within three days of the fire, there were six inches of green leaves on the buffelgrass.

Preliminary Draft HCP review schedule

Jamie reported that the Greater Southlands Preliminary Draft HCP was revised in February 2008 and OCSD staff recently revised the Avra Valley Preliminary Draft HCP, submitted to Arizona Game and Fish Department on May 30. OSCD requested that TAC members review and provide comments and questions for the Avra Valley Preliminary Draft HCP by August 22 and the Greater Southlands Preliminary Draft HCP by October 24.

Climate Change and HCPs meeting

Leslie Liberti, Director of the City of Tucson's (COT) Office of Conservation and Sustainable Development (OCSD) attended a conference in Laughlin, Nevada this past April on Climate

Change and the Southwest. Faculty and staff from the University of Arizona as well as staff from the Sonoran Institute were also present. Since the TAC considers climate change a "changed circumstance" as opposed to an "unforeseen circumstance" as defined by the USFWS, the COT needs to consider ways to address the subject in the HCP. Thus, Jamie reported that OCSD staff recently convened a meeting with Travis Huxman, Gregg Garfin, Guy McPherson, Mike Crimmins (all affiliated with the University of Arizona) as well as Rebecca Carter (Sonoran Institute). After the preliminary meeting, it was decided that a follow-up meeting with USFWS staff would be helpful. The meeting will occur in mid-August. Trevor suggested that OCSD also invite Carolyn Enquist of The Nature Conservancy. *[Action Item: OCSD staff invite Carolyn Enquist of The Nature Conservancy to the next preliminary discussion on climate change and HCPs.]*

Trevor asked Marit if USFWS staff members in the national office have discussed addressing climate change as part of HCPs. Marit said she thinks this will occur at the regional level.

4. Discussion

A. Avra Valley and buffelgrass (Travis Bean):

Travis reported that he was contracted by the COT to work on two buffelgrass-related projects in Avra Valley. One project involved mapping all of the buffelgrass within a 1,200-acre study area and the other involved conducting a seedbank study. He said that the purpose of the seedbank study was to collect baseline data on native and non-native viable seeds and compare that with seed density after herbicidal treatment of buffelgrass by the COT. If mature buffelgrass plants are removed, one of his research questions sought to determine if buffelgrass seed density decreased correspondingly. The second question sought to answer whether or not the native seed density increased if the buffelgrass seed density decreased. Travis reported that herbicide spraying was originally planned to begin in August 2006. However, this did not occur. Yet, his team had collected baseline samples in June 2006 in anticipation of the COT's spraying. Travis said that they were initially funded to perform two collections and so another baseline collection was made in July 2007. The first chemical control treatments were conducted in August 2007. He said that if his team collects soil samples before the 2008 monsoon commences, they could get their first post-treatment evaluation in terms of effects on the seedbank.

He reported that they did not meet any of the objectives because they have not yet collected any post-herbicidal treatment samples. However, he said that there were interesting findings nonetheless. He referred to the plentiful monsoon rains that occurred in 2006. Oddly, he said, this did not translate into an increase in the seedbank for either native or non-native species. He said that he thinks this has repercussions for restoration activities. That is, increased seed production does not necessarily translate into increased seedbank density. So, direct seeding may not be effective. He said that continuing with the seedbank study would help determine if changes in seedbank density relate to herbicidal treatments of buffelgrass. He said that he was seeking funds to continue the study. One of the reasons he thought that the TAC wanted to undertake the study is because of a desire to perform restoration activities on those lands, replacing the buffelgrass with native plant species. However, he said that the question is how

soon should restoration activities commence after herbicidal treatment of buffelgrass given the changing density of buffelgrass in the seedbank over time.

Travis continued by saying that native perennial plants naturally establish periodically. In any given year, there is a slim chance that these plants will germinate and the chances are even slimmer that favorable years will occur back-to-back to allow these plants to establish. He said that saguaro establishment takes place every 20 to 50 years. According to Ray Turner, there has not been a large saguaro recruitment event since the late 1800s. Given the low likelihood of establishment occurring in any given year, applying native seeds as a restoration strategy may not make the most sense. He added that the COT removed wells on the properties, which could have aided restoration. Rich asked if the well casings still remain on the properties. Travis said that it is very expensive to refit the wells. Ries said that many of the properties in Avra Valley were purchased for the specific purpose of retiring the water rights. But, he said that he didn't know the condition of the well casings.

In addition to seeking funds to continue the seedbank study, Travis also requested funds to study the percentage of viable native seeds remaining in the seedbank over time as part of any COT seeding efforts. This would help determine the effectiveness of this restoration strategy. Travis said that he is skeptical of the effectiveness of direct seeding because of the aridity and irregular precipitation that are characteristic of the area. Dennis said that it sounds like the essential element for restoration success is water. If there is adequate water with enough frequency, there may be some success. Travis said that was correct. He added that with the current seeding practices, he doesn't think that viable seeds would remain in the seedbank for more than a year and so the study would likely conclude after one year.

Rich said the deposition of seed is episodic just like germination. Factors such as wind, rain, or other elements can carry seed away. Given this, Rich said that he didn't think it made sense to disperse seed as currently practiced by the COT. Travis said that there are 50 to 80 years of literature saying that seeding in lowland deserts doesn't work. However, it is still being practiced. One of the arguments that dryland seeders use is to say that the seed remains in the soil for up to ten years. Travis said that the second study he proposes would seek to answer the question of how long the native seed remains in the seedbank. Jamie wondered if this study should be funded with HCP funds or should be undertaken directly by Tucson Water since they are directing the restoration activities. He said that the TAC has determined where the habitat areas are and are not. There is concern about buffelgrass encroachment, but in terms of restoring all of the lands within the HCP planning area, he said that he was unsure if the COT has made those commitments as part of the HCP.

Travis said that, in prior discussion with Harold Maxwell (Tucson Water Department), one goal of applying native seeds on some of these lands is to get the lands to a restored state such that blowing dust, buffelgrass, and tumbleweed are no longer management concerns. If something doesn't replace the buffelgrass once it is eradicated, then there will be blowing dust or some other problem. He said that when Ann Audrey and Leslie Liberti were involved in the conversation, the question was when the COT will be able to re-seed on the lands where buffelgrass was treated and eradicated.

Ries asked about the effectiveness of encasing seed in a mud mixture, "pelletizing" the seed. Travis said that the literature he has read suggests that it does not work. He said that he evaluated the pelletized seeding performed on the Simpson Farm and there was virtually no plant recruitment using this technique.

Rich said that it would be helpful to have more quantitative data on the liabilities that Tucson Water is trying to address (e.g., blowing dust). Trevor said that $16,000 for Travis' second proposal seems like a small price to pay to determine the effectiveness of the restoration strategy currently being employed. He said that this may not be an HCP issue because the TAC and the COT have already quantified the mitigation lands. How it does involve the HCP is through the issue of encroachment by buffelgrass on these mitigation lands. He said that he thinks this study would be useful for Tucson Water to undertake. He suggested continuing with the work Phil Rosen has done to examine mammal and invertebrate use of the degraded lands and getting them back to a level in which the soil characteristics will support native vegetation. Travis said that it sounds like he should take his proposal directly to Tucson Water staff in charge of restoration work. Trevor said that the buffelgrass issue needs a regional approach involving Pima County and the Town of Marana as well. Travis said that Pima County funds his position.

Since Guy could not attend the TAC meeting, Guy approved a brief summary of a discussion he had with Jamie about Travis' preliminary report. Jamie read Guy's comments to the TAC, which were:

> *The order of magnitude difference between the two baseline sample sets suggests that the difference between any treatment effects and the control baseline must then be several orders of magnitude to attribute seed density changes to the treatments. This is unlikely to occur. Herbicide applications on buffelgrass patches within Saguaro National Park have occurred since buffelgrass was first observed there. Despite this treatment, buffelgrass continues to spread throughout the Park. For these reasons, continuing with further buffelgrass seedbank studies within the Avra Valley HCP planning area is not likely to generate reliable conclusions for management decision-making nor will such studies change the fact that the ubiquitous nature of buffelgrass seed means control efforts must occur in perpetuity.*

Travis said that a large reduction in buffelgrass seed is possible because the plants are eradicated 100 per cent if the herbicide is correctly applied. As far as Saguaro National Park is concerned, Travis said that he didn't know if Guy was familiar with the nuances of control efforts in Saguaro National Park. Through 2000 and 2004, Saguaro National Park staff were controlling between 20 and 40 acres. Only in the last two years have Saguaro National Park staff considered re-treatment and the seedbank. Early treatments involved eradicating buffelgrass in an area and then considering that area completed after which another area was targeted the following year. And, in 2005, because of budget constraints, Saguaro National Park staff was unable to treat any areas for buffelgrass.

Trevor said that he thought that answering the question about buffelgrass seed in the seedbank would be worth the cost. Rich said that he is in favor of funding the first proposal but wondered

if Travis could put his mind to the factors that may not have occurred in recent years when samples were taken, but that could occur and have an effect on germination and establishment. Linwood said that he would like to see the study funded as well. Ries said that it was worth following up. He said that Tucson Water's goal is to find the magic combination where buffelgrass has been eradicated to a point where native plants will propagate on their own, so that that lands managed themselves in a natural state. Linwood, Rich, Trevor, and Ries agreed to fund the first proposal for another year and Travis will report results to the TAC in the first few months of 2009 year. *[Action Item: OCSD staff will coordinate with Travis Bean on a new contract for the one-year continuation of the buffelgrass seedbank study]*.

B. Avra Valley and Greater Southlands: Urban Amphibian and Reptile Biodiversity (Phil Rosen)

Phil reported on his project entitled, "Urban Amphibian and Reptile Biodiversity: Report to the Technical Advisory Committee (TAC) for City of Tucson Habitat Conservation Plan (HCP)." This involved several small studies including: "Lizard Population Evaluation/Monitoring Design," "Giant Spotted Whiptail Survey – Pantano Wash-Vail Area," "Western Groundsnake Survey in Avra Valley," "Ecological Restoration in Tucson-owned Avra Valley Lands," "Amphibian Population Survey in the Vail Area and Avra Valley," and "Amphibian Infrastructure Survey and Design." Phil briefly reported on each of these studies.

To begin, he said that he performed a survey of the giant spotted whiptail in the Vail area as part of the Greater Southlands HCP planning area. None were detected, but he said that the habitat looked suitable in the Cienega Creek Pima County preserve. His work suggests that it is absent for historical reasons and might exist in this preserve if it dispersed there or was translocated. The nearest place where the species exists is in the Madrona/Empire Cienega area.

Phil continued his report, saying that he also surveyed for the Western groundsnake. He obtained several new records of observations and demonstrated that the species has a fairly extensive distribution on the west side of Avra Valley. From Silverbell Road near Ironwood Forest National Monument down past Milewide Road and the Blanco Wash, there is a persistent population of the Western groundsnake. He noted that the species occurs on COT property. Phil said that he also surveyed for the species on the east side of Avra Valley where it occurs only extremely locally. He added that there are records of observations spanning over six decades and they are all within two tenths of a mile on Frontage Road near Marana. He said that there is a local population there and it picks back up at Red Rock. The Red Rock population is waning because the Central Arizona Project (CAP) canal impedes sheetflow into the site. However, where the CAP is siphoned underground and a wash comes through, irrigating the floodplain, the species should survive for a long time. This species lives in flats with dense soils of clay and silt. Blanco Wash contains these features, making it good habitat.

Phil said that he also observed a groundsnake south of the Southern Avra Valley Storage and Recovery Project site (SAVSARP), west of Sandario Road, and south of the Tohono O'odham lands in Avra Valley. This suggests that there might be another population in the southern end of Avra Valley. He said that it is possible that the species distribution extends into Alter Valley. However, since there are no records there despite many hours of road cruising south of Three

Points, that is less likely. He said that he is still working with the Town of Marana on the issue and he may go to Phoenix and meet with Randy Babb and others to talk about Western groundsnake occurrences in urban environments. Phil said that this is a species that has a good chance of persisting if a moderate amount of care is used to protect it. In terms of Tucson Water and the COT properties in Avra Valley, it probably wouldn't take too much to make it flourish. It looks like there are plenty of existing animals there to supply a population as long as the landscape doesn't become degraded.

Dennis asked what the vegetative characteristics for groundsnake habitat are. Phil said that he didn't know under urban conditions. It looks like the species is pretty adaptable. It needs moisture such as in mesquite bottomlands. Usually, these areas are characterized by the presence of mature mesquite such as those within a mesquite bosque. Also, areas where the water pools up contributing to understory vegetative diversity seem to be suitable for the species. Generally, these are areas where the ground cracks when it dries. The records, except for the southernmost ones, are right along the Blanco Wash. The southernmost record contained savanna. Phil added that he has groundsnakes in captivity and when they get dry, they go to the water and sit there. However, other desert snakes don't bother going to the water.

Rich asked Phil how many species of groundsnake there are. Phil said that in the U.S., there is one but it is a variable animal and so he wasn't sure what would result from a genetic study. There is another member of the genus in Sonora that looks like a coral snake. Rich asked how far north the species occurs. Phil said that they occur in a line diagonally across the state through Sedona and up to the southern tip of Nevada. In the mountains north of Phoenix, it appears to have a fairly wide distribution. In southern Arizona, it has a narrow distribution, especially in the desert. He said that he mapped this distribution and addressed it in more detail in his report. Ries asked if the species occurs in Chihuahuan desert and Phil said that he would have to reference range maps to answer the question.

Jamie asked about the suitability of the Brawley Wash lands as habitat for the groundsnake. He referenced part of Phil's report in which Phil stated:

> *In contrast [to Blanco Wash lands], Brawley Wash lands, which have been stripped of sand and silt by channelization and drainage, leaving behind hard adobe soils, are, insofar as has been determined, un-occupied by this species. There appears to be too much erosion, and not enough pooling to provide suitable habitat.*

Phil said that there has been so much degradation in the Brawley Wash system that the groundsnake has not persisted and is probably "long gone." He said that the system was drained for farming, carrying waters away from the natural channel. He located suitable vegetative cover within the Brawley Wash and surveyed in those areas. However, there are no historical records and he has not observed any in this wash system. He said that between SAVSARP and Three Points, there might be a different scenario as the Brawley Wash system there isn't as degraded. However, it is more arid and lacks mesquite bosques. It is probably worth looking there. But, he said that it didn't change his perspective on the lack of suitable habitat in the Brawley Wash. He said that his recent surveys have just reinforced this view.

Phil reported that he studied lizard abundance in parts of Tucson with a couple of objectives. One objective was to see what the resource is in terms of riparian corridors in Tucson. The other objective was to see if those riparian corridors could support lizard abundance despite being constrained very tightly within urban habitat.

With regard to flood impacts, the essential question was whether species that are restricted to these corridors (e.g. confined within soil cement arroyo walls), like the zebra-tailed lizard, could survive flooding impacts. Phil said that, in 2006, there was a flood of record on the Rillito River, which deposited sediment in many areas and filled the channel. Despite the event, these lizards did not appear to be adversely affected.

The second set of findings from this study was that there is extremely high lizard abundance along the Rillito River. Abundances ranged from 40 to 110 lizards observed per hour. In comparison, the highest number of lizards observed at Organ Pipe Cactus National Monument over a number of years was 32 per hour. In high quality Sonoran Desert, observations usually range from 15 to 20 lizards per hour. Despite being in the middle of the City, lizard abundances are so high that conservation biology would not want these lands sacrificed. Phil mentioned the Pima County-owned search and rescue meeting house located at Craycroft Road along the Rillito. Under this mesquite bosque, there is great floristic diversity as well as snakes, roadrunners, and hawks. And, he said that there are literally "herds" of lizards. This would have been one of the core areas for cactus ferruginous pygmy-owls (CFPO) prior to the species' population decline. Since the CFPO is a lizard eating species, these high lizard abundances might be directly relevant for the recovery of that species.

Phil said that the third finding with respect to lizards is that he compared his results, ranging from 2001 to 2007, with historic museum records. He and his team reconstructed a picture of the original lizard abundances post Spanish times and found that the Rillito River has not changed very dramatically. The lower Rillito River by Campbell and First Avenues was a crossing where early herpetologists collected data. Phil said that it has always contained a good arid lizard fauna and it still does with a slight loss of diversity. Moving east to the Fort Lowell area, it is more mesic and riparian species are present. There are no giant spotted whiptails present now and a record back to the 1890s states that the species was never recorded there. Any giant spotted whiptails that were there were present prior to any agricultural irrigation or any disturbance from grazing. However, riparian species such as Clark's spiny lizard are present. However, they are declining gradually in the upper Rillito River system. The same is true with the Sonoran spotted whiptail, a unisexual species.

In contrast to the upper Rillito River system, the Santa Cruz River has changed considerably. It once had a mesic, riparian lizard fauna, the giant spotted whiptail and fence lizard being the most conspicuous. The West Branch of the Santa Cruz, the most intact area on the Santa Cruz River in the region, has seen a dramatic decline in riparian species such as Clark's spiny lizard. And, the giant spotted whiptail is nearly gone. The fence lizard is probably completely gone. What is interesting and surprising is that the Sonoran spotted whiptail, which is a unisexual female species, was not originally present along the Santa Cruz but is currently present. Phil said that he went to many museums, counted scales of specimen under a microscope, and they were all giant

spotted whiptails. Now, they are all Sonoran spotted whiptails. He said that disturbance seems to favor unisexual lizards because every egg produces an egg producer and so the species can expand twice as fast per generation. Any time there is free population growth into an ecological vacuum, the unisexual lizards are at an advantage. In contrast, the stable, riparian thornscrub and gallery forest would have a more stable population and more well-adapted species such as the giant spotted whiptail.

Rich asked about the lizard species dynamics if degraded lands along these rivers were restored. Phil said that all whiptails are pretty much alike. It would take a long time before a normal, bisexual lizard replaced a unisexual species because they are almost ecological replacements for one another. He said that he wouldn't expect to see fast change in whiptail species if degraded lands were stabilized. If good conditions were created for the giant spotted whiptail where it currently lives, the population would likely increase slowly. From the standpoint of owls or hawks, Phil said that he didn't think the species of whiptails present will have much of an effect on the raptor population.

Phil reported on his study of anurans – toads and toadlike frogs – in which he surveyed the Vail area. He found that, along the Pantano River, in areas formerly used as gravel operations, he observed some substantial populations, especially of Great Plains toads and several other species. In existing cattle tanks closer to Vail, he observed good populations of anurans. He said that there are four species widespread in the Tucson area. He said that he then completed a study of the anurans in the Greater Southlands area, especially Cuprite Wash, Flato Wash, and Franco Wash. Those three washes had five species, including large and significant populations of the narrow-mouthed toad. The Greater Southlands would seem to be the best area in the Tucson region for these animals as it has the most diversity and abundance. This area had never been surveyed and was, therefore, completely unknown. Phil said that low lying flats functioning as floodplains within the bajada that support natural scour ponds as well as stock ponds have animals living in them in great numbers. He said that he also surveyed many parts of Avra Valley and observed lower species abundance and diversity there as compared to the Greater Southlands, Vail area, and Tucson's riparian corridors. Performing the snake survey earlier this spring, he said that on some of the COT-owned properties in Avra Valley, there are really good breeding pools. Yet, there is more out there than he was able to document given the challenges of accessing some of the properties. He said that there weren't many big surprises, yet Avra Valley is an area where a lot of anuran species would do well if there was ecological management occurring.

In terms of guidance on how these species might be conserved in an urban setting, he said that he completed a report for Pima County, which can be accessed at: http://rfcd.pima.gov/reports/pdfs/conservation_urban_amphibs_2008.pdf or found via: http://rfcd.pima.gov/reports/#wrd For this report, Phil said that he focused on how the flood control infrastructure might be allowed, or modified, to function as amphibian habitat. The report also investigated mosquito breeding in anuran and amphibian breeding habitat and natural control of mosquito larvae by aquatic animals. *[Action Item: OCSD staff will e-mail the link to Phil's report to Pima County on urban restoration for amphibians and reptiles]*.

Rich asked if Phil thought that the anuran population in Avra Valley is depressed because of pesticide presence in the soil. Phil said that he would guess not because he has never seen dead anurans in the Southwest as a result of spraying. They are breeding in Pantano Wash near Broadway Boulevard and other places that have or had pollution. If DDT or other chemicals that bioaccumulate were present, then this may contribute to a depressed population. He said he has found anurans in decent abundances in close proximity to farm fields in Avra Valley. Instead, Phil said he thinks that the relatively low population of anurans in Avra Valley is likely due to the fact that cattle tanks, and therefore breeding habitat, have not been maintained as well as the generally impoverished quality of the land surface.

Trevor asked if Phil observed bullfrogs in the Vail area. Phil said no as those are ephemeral stock tanks. However, out in the Pantano Wash, the gravel pits support bullfrogs. From a long-term perspective, this is a threat to aquatic conservation but it is not an active threat to what is living there currently. Trevor said that the TAC is interested in retention / detention flood control structures in the Greater Southlands as habitat.

Dennis asked if the City's recharge basins in Avra Valley (i.e., CAVSARP) were studied as potential habitat. Phil said that he did not study this and Dennis asked if this would be worth looking into. Ries said that the basins go through a wet / dry cycle on a regular basis in which they are wet only for a week or two and then are dry for a long time. This is so that the bottoms crack and accept recharge. Phil said that Couch's spadefoot toad needs standing water for 7.5 days or longer to breed. Another species needs 12 days and most species need 20 days of water. Phil said that these basins could be potential habitat but he has not detected any sign of amphibian populations building up there. He added that he would need specific information on how long the water stays in the basins and when, during the year, that happens. Phil said that an ecological trap could be created if a lot of water is released into the basins which are then drained in a short period of time. This would be something to avoid, if possible. However, if the basins were designed to hold water for twenty to thirty days during the summer, big populations might develop there. If there is any interest in learning more about recharge basins and amphibians, Phil said that he would be happy to study it. Trevor said that it might be worth asking maintenance staff if they ever hear amphibians.

C. Eastern Pima County Trails Master Plan update and the Greater Souhthlands (Steve Anderson)

Steve reported that while the Eastern Pima County Trails Master Plan is 20 years old, it has "held up well." He said that the original planning process was done at a very high level and there has been a great deal of volunteer support through trail inventory. In the Plan, there are 1,500 miles of individual trail corridors, including trails that go along washes, utility corridors, public rights of way or that go cross-country. However, not all of the trail alignments are still viable because of development. For the first five years that the plan existed, there were no staff members ensuring that trail corridors were protected when developments were reviewed. Even though some alignments are no longer viable, they have been kept on the map in case conditions change.

Steve said that would like the river park system to form a wide band that surrounds the urban core. River parks have been in the region since the 1980s. Originally, these trails were adjunct to

flood control projects in which a 10-foot path and pipe rail were installed next to bank protection. Now, there is a different concept of these trails. Current aims for the river park systems include:

- Creating a three dimensional corridor as wide as possible,
- Protecting or installing as much native vegetation as possible,
- Creating a paved pathway for recreation and fitness as well as for alternative modes of transportation,
- Creating a soft path for those who would prefer not to be in the fast-moving, asphaltic condition,
- Creating or maintaining urban wildlife habitat, and
- Creating linkages between these river corridors and the washes that link to the natural open spaces around the Tucson Basin.

Rich asked if the trails were non-motorized only and if horses were allowed. Steve said that these are non-motorized trails and that horses are allowed. Horses are one of the reasons for the dual pathway configuration, and this gets at the larger goal of preserving some of the original character of the community. To make it safe for equestrian use, they install an 8-foot wide meandering decomposed granite path, ideally separated from the asphalt path and under a canopy of trees. The north bank of the Rillito River near the intersection of River Road and La Canada Drive is a good example of what Steve and his Department envision for new alignments. He said that this area has a mesquite bosque. The standard now for river park is a 100-foot wide trail alignment, which was doubled in 2003 from the previous 50-foot standard.

Steve said that most of the Plan will remain the same as it is being updated. One thing that didn't happen much during the development of the original Master Plan was to focus on the urban core. The reason for this is that it is difficult to retrofit trails into the existing urban fabric. Unlike many parts of the Midwest or East which have capitalized on abandoned rail corridors, there are not many corridors. In Tucson, there is one abandoned rail corridor, the El Paso and Southwestern corridor.

The other area where there is not much planning has been done is in the Greater Southlands. Thus, he said that he and his staff can take any advice from the HCP Technical Advisory Committee. The timing is good as they will be looking at this area in the near future. Currently, there are alignments along the Flato and Franco washes, a few utility corridors, and not a lot else. There is one greenway along Sahuarita Road to link the Arizona Trail with the Anza National Historic Trail, which is about 18 miles. He said that the Greater Southlands HCP Planning Area includes the northeast corner of the Santa Rita Mountains and associated bajada north to Sahuarita Road.

In the Sonoran Desert Conservation Plan, there is a proposed 11,000-acre mountain park in the area of which 8,800 acres is Arizona State Land Department land. Currently, there are no mountain parks in this part of the metro region. This mountain park would link well with the Davidson Preserve that was suggested in the SDCP as well as the Cienega Creek Preserve. In addition, this mountain park would help create a green edge to the metro area, it would also

protect the viewshed, and would also protect the Highway 83 Scenic Drive. Also, the Arizona Trail goes through this area and this will likely become a National Scenic Trial.

David said that he had not heard any specific discussion of this proposed mountain park and could not comment. Rich asked if Pima County Natural Resources Parks and Recreation had the ability to get easements from the private sector. Private donations of easements for trails do occur, but this is underutilized. He said that there are tools in Pima County's Code to work with private individuals. For example, he said that if giving Pima County trail access would create a substandard lot, the landowner would get credit for that donated square footage. This prevents the lot from being categorized as sub-standard and precluding the original goals for the property. Thus, they search for win-win opportunities and revise Pima County Code to provide incentives for community amenities. Rich said that Maricopa Parks has a non-profit organization for the purposes of funding the regional trail. Steve said that Pima County has the Pima County Parklands Foundation and the City of Tucson has a foundation as well. In his experience, however, both are underused and that they often find out about donations by accident.

Steve said that the public wants to recreate in an open space setting close to where they live. This helps reduces human impacts to large parks on the edge of town. An example is the "Fantasy Island" park, which was designated as a park through conversations with the State Land Department Commissioner and others. Pima County recently completed a management plan for Tucson Mountain Park and Steve said that one of the theories they are testing is the ability to satisfy recreational demand on the edge of the Park. The primary purpose is to reduce human impacts in the interior of the Park and, therefore, protect wildlife habitat.

In thinking about trails in the Greater Southlands, Rich asked about Pima County's ability to close river park corridors for several weeks if a sensitive species is, for example, nesting in the area. Steve said that his department has never been confronted with that issue. He mentioned that the Pima County Regional Flood Control District purchased lands along the west branch of the Santa Cruz River with the intent to limit access to those lands as they were purchased to protect habitat. Thus, there is no river park that goes through that area, only a primitive trail. Steve said that if there are areas in the Greater Southlands with a high degree of sensitivity, Pima County would opt to not develop a park or trail system in the first place. Steve mentioned how Pima County plans to intentionally avoid developing a river park corridor along the Tanque Verde Wash between Tanque Verde Road and the Coronado National Forest. He and his staff ensure that the trailhead sizes and trail widths are compatible for the natural resources.

Jamie asked how trail design changes for alignments within Pima County's Conservation Lands System (CLS). Steve said that he and his staff avoid CLS if possible. However, if avoidance is not possible, then the trail corridor would likely be the lowest intensity, most primitive type unless an urban link is necessary. He mentioned that his staff coordinates biological and cultural surveys prior to any trail building. Their goal is to have one of the best trail systems in the United States while being as sensitive and sustainable as possible. He said that these are values that they take seriously.

Trevor said that one of the elements they are looking to protect in the Greater Southlands as part of the HCP is the wash system. One idea that was discussed at previous meetings was the use of

linear parks as a way to protect or enhance the habitat. However, in trying to protect wildlife habitat this could be a conflict. He said that linear parks with interpretative signage are appropriate in many cases, but the TAC has discussed the need to have fairly wide protected areas along the washes and systems of washes. Some access would be allowed but only on the edge of the habitat, not in the middle. Another idea is to protect many little pockets of habitat given that there will likely be high density development, such as detention basins, designed for natural habitat or for interpretation of nature. Steve said that if the TAC has specific concerns or recommendations for any of the areas in the HCP planning area, he would be glad to incorporate them into trails planning. In fact, there is enough flexibility that no trails could be planned for the area if that is the TAC's recommendation.

Steve said that it might be helpful to have a joint charette to identify possible trail corridors. In about six weeks, he and his staff will look more closely at the Greater Southlands as they work to update the Plan. So, there is time to determine if the TAC has any particular recommendations.

Jamie asked the TAC if creating a linear park system in which trees are added would actually enhance the habitat for covered species. Trevor said that one of the things they are trying to promote is mesquite bosques, especially as a corridor for pygmy-owls. However, in terms of combining a bosque with recreation trails, he wasn't sure how that might impact the species. He wondered what the USFWS position is on restoring habitat for a species but which is part of a recreational trail. Steve said that the USFWS guidance that they used when the CFPO was listed involved not removing any mesquite trees with understory and keeping a certain distance from saguaros with holes. Ideally, they would not remove any plant materials at all. However, plants that could not be avoided would be salvaged. He said that Pima County uses the latest in sustainable design and construction techniques.

Rich asked about barrier-free trails. Steve said that Pima County has a park called Feliz de Paseos that has worked really well and is dedicated to universal access. So, for example, the signage is placed lower to the ground and the drinking fountains are accessible. A future example will be the Crow Wash trailhead of Tortolita Mountain Park in which two loops will be designed for universal access.

Trevor asked about the alignment for the Sahuarita Road Greenway. Steve said that it would be on the north side of the road. As part of the Major Streets and Routes plan, the right of way is 300 feet and so Steve said that there should be plenty of room within it for a trail. In terms of construction, it would involve a main, paved path with a meandering soft path around vegetation. As part of the design process, Jamie asked if water harvesting is incorporated into revegetation along trail corridors as opposed to irrigation. Steve said that he and his staff try to take advantage of water harvesting whenever possible.

Trevor suggested that OCSD staff share with Steve the map of what the TAC considers the ideal for species protection in the Greater Southlands HCP planning area. Trevor said that this means protecting as much of the southern and eastern portion as possible and protecting washes throughout the Southlands. Jamie referenced the map hanging on the wall and described how the latest version of the conservation strategy for the Greater Southlands involves adopting the CLS for blocks 2, 3, and 4 (the south and eastern portions of the HCP planning area) while block 1

would primarily involve the City's existing wash and native plant protection ordinances. Steve said that much of the land on the east side of the planning area is part of the State Trust land conservation proposal. Much of that land will be conserved if the initiative is successful.

Trevor asked if State Trust land can be leased for the purpose of building a park. David said that it is possible but this option does not work well. Steve said that Pima County would prefer to purchase property so that Pima County would own any investments made on the land in perpetuity. Instead of opting for a 10-year lease for trail access for the Arizona Trail, Steve said that Pima County purchased a perpetual right-of-way from the Arizona State Land Department at a cost of $114,000 for over 20 miles.

Rich said that education will be a component of the HCP and so he recommended that Pima County and the COT partner on design of interpretive signage for trails and parks. Steve said that, as part of the update to the Eastern Pima County Trails Master Plan, his team is creating uniform signage for all of the jurisdictions, including a uniform trail numbering system. His graphic design team is able to produce nice signs cost effectively using any text provided by the jurisdictions.

D. Desert Tortoise (Sonoran population) Surveys

Jamie reported that no environmental consultants have been awarded contracts from the environmental consultant Request for Proposal (RFP) process. The delay is attributed to lengthy back and forth discussions with one selected consultant that was unable to meet City insurance requirements. Also, increased scrutiny of spending proposals due to the City's budget shortfalls causes delays. Jamie said that the RFP for environmental consultant services was written in a general way and so he drafted a specific RFP for desert tortoise surveys for the TAC to review and comment on. Trevor recommended that OCSD staff investigate the option of using any on-call environmental consultants for this work. *[Action Item: OCSD investigate the use of City on-call environmental consultants to perform the desert tortoise surveys.]*

Dennis suggested deleting the word "approach" in the first line of the second paragraph. Rich and Trevor said that presence/absence surveys are all that is needed since we have the modeled habitat. Thus, this should be stated in the objectives. Trevor also said that the modeled habitat areas in the northeast portion of the HCP planning area do not need to be surveyed as these areas have already been determined to have desert tortoises. Linwood agreed and also recommended requiring a page limit for the proposals. Linwood added that one season of desert tortoise presence/absence surveys could indicate if desert tortoises are in the area as long as at least one desert tortoise (or its sign) is observed. However, he said that one season of surveys in which no desert tortoises (or their sign) are observed does not indicate either that the species is present or absent. Trevor said that a good consultant will tell the COT that, for example, in one area, four tortoises were observed and so they will recommend going back to that area to see if it has abnormally high density. Rich said that density should not be considered during the initial effort, only where they are observed by presence of the tortoise or its sign. Marit asked about any existing survey protocols. Linwood said that he didn't know if the Arizona Game and Fish Department (AGFD) has a desert tortoise survey protocol for the Sonoran population. Dennis said that Erin Zylstra (University of Arizona) is working on developing the best strategy for

locating desert tortoises. Dennis said that David Grandmaison is currently doing desert tortoise work for AGFD.

Jamie asked for clarification on the goal of the survey. Linwood said that this would confirm that there are desert tortoises in the modeled habitat areas so that the TAC would not just be speculating. And, from the initial survey, the data may suggest areas which should require more or less survey effort on the part of the developer. Trevor concurred and said that if the COT sponsored desert tortoise survey is not very expensive, then perhaps this could be performed annually for a number of years to better determine whether or not requiring desert tortoise surveys prior to construction is a necessary requirement of developers. Rich said that he views this as another layer of the adaptive management approach to define the core of what is important in the HCP planning area. This initial survey will provide baseline data after which the pre-construction surveys will continue to provide information on the population. Jamie said that this may necessitate creating a uniform mechanism (e.g., develop standard requirements for data collection) for obtaining the data from developers who perform these surveys so that the data are consistent and are shared with the COT. Rich suggested that one entity (e.g., local jurisdiction, state agency) should serve as the local repository for all of the species data. This way, data acquisition can be adjusted based on regional trends or needs.

5. Call to the Audience

Lynn asked about the agenda topic of climate change and HCPs as she was not present during that part of the discussion. Jamie summarized the update.

Trevor said that at Marana's Technical Biology Team meeting, it was recommended that Town of Marana and COT staff meet with Brian Powell (Pima County) to talk about ecological monitoring. Trevor said that OCSD staff would likely hear from Town of Marana staff about this.

6. Adjournment

The meeting was adjourned at 4:10 p.m.

Summary of Action Items:

- OCSD staff will invite Carolyn Enquist of The Nature Conservancy to the next preliminary discussion on climate change and HCPs.
- OCSD staff will coordinate with Travis Bean on a new contract for the one-year continuation of the buffelgrass seedbank study
- OCSD staff will e-mail the link to Phil's report to Pima County on urban restoration for amphibians and reptiles
- OCSD staff will investigate the use of City on-call environmental consultants to perform the desert tortoise surveys